

Temporal Variations in the Uranian Near-IR Geometric Albedo

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Over the period August 1995 – August 1996 the near-infrared geometric albedo of Uranus showed distinct variation. We obtained images of the planet in 10 broad and narrowband filters using the ARC 3.5 meter telescope at Apache Point Observatory. Along with the albedo variations we saw significant changes in the contrast of the planet. Data acquired in August 1995 (Walter & Marley 1995) show the same high altitude hazes encircling the south polar region as seen by Baines et al. (1995) from the IRTF two days prior to our observations and by HST in August 1994. Followup images from June 1996 no longer contain this asymmetry, instead showing a homogeneous disk with corresponding lower albedos at matching wavelengths. Observations will also be made in late August 1996.

We modeled this data by computing theoretical monochromatic albedos which were then integrated over the filter bandpasses. These filters were chosen to best probe a variety of atmospheric levels, with continuum filters probing down to the CH₄ tropospheric cloud and beyond. Filters selected in the deep H₂ and CH₄ absorption bands allow us to examine the structure of hazes in the upper stratosphere, whose small reflection contributions dominate in these dark filters. Preliminary analysis of information from two very different states of Uranian weather shows evidence for temporal variability in the vertical location and thickness of the CH₄ cloud as well as the incompatibility of extrapolating optical stratospheric haze characteristics in the near-infrared.

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Baines, K. H., Yanamandra-Fisher, P., Lebofsky, L. A., Momary, T. W., & Golisch, W. 1995, BAAS, 27, 1088.

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